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Biosynthesis and compositional regulation of poly[(3-hydroxybutyrate)-co-(3-hydroxyhexanoate)] in recombinant *ralstonia eutropha* expressing mutated polyhydroxyalkanoate synthase genes.

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A new strategy for bacterial polyhydroxyalkanoate (PHA) production by recombinant *Ralstonia eutropha* PHB(-)4 harboring mutated PHA synthase genes (*phaC(Ac)*) from *Aeromonas caviae* was investigated. The strain harboring wild-type *phaC(Ac)* gene produced a PHA copolymer consisting of (R)-3-hydroxybutyrate and (R)-3-hydroxyhexanoate [P(3HB-co-3HHx)] with 3.5 mol-% of 3HHx fraction from soybean oil. When the mutants of *phaC(Ac)* gene were applied to this production system, 3HHx fraction in copolymers was varied in the range of 0-5.1 mol-%. Thus, the regulation of PHA copolymer compositions has been achieved by the use of mutated PHA synthase genes.